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### IMPROVEMENT OF THE PROCUREMENT DELIVERY TIME IN PT LEN INDUSTRI (PERSERO)

Nauzie Novryadin and Mursyid Hasan Basri  
School of Business and Management  
Institut Teknologi Bandung, Indonesia  
[nauzie.novryadin@sbm-itb.ac.id](mailto:nauzie.novryadin@sbm-itb.ac.id)

**Abstract**— One of the problems facing today in PT Len Industri is the speed in the procurement of goods. Based on procurement data in 2009 to 2011 there is an increase of time delays in the procurement delivery in that 3 years. To find the root cause of the problems faced, we used the CRT (Current Reality Tree) method. As there is no sufficient quantitative data, to find the root cause, more qualitative assessment were used, based on key stakeholder experience, through interview and discussion session. From the CRT method we found 9 (nine) root causes. There are several alternatives that could be used as solutions to overcome the root cause. The alternatives are divided into 3 (three) parts, namely the Procedure & Process (Simplification of procedures and Control Card & Form), Human Resources (Improve the HR capability and Recruitment for New Employee ) and Information System (Information systems Improvement and E-procurement). Implementation plan of the solutions offered above is divided to three following periods short term, medium term and long term. With the total cost of the improvement plan of Rp. 213.6 million and could be removed the potential fines between Rp. 19.6 million per day up to Rp. 35.3 million per day, it is time for the management of PT Len Industri to undertake corrective action to procurement system as proposed by this Final Project

**Keywords:** Procurement, Delivery Time, CRT, e-Procurement

#### I. INTRODUCTION

In PT Len Industri, a state owned company, as an EPC-based company, the successful implementation of the project is very important thing. Among the successful factors for project implementation is pace procurement of goods to the project needs. The project will be run properly if the goods are available at the time in accordance with the project schedule. If there is delay in supply of goods for the project, it will affect the project completion schedule, especially if the goods are required in sequential work, it will

further slow down the completion of the project as a whole.

Procurement of goods in the PT Len Industri conducted by the Logistics Dept. One of the problems facing today is the speed in the procurement of goods. Based on procurement data in 2009 to 2011, we obtained Table 1 and Figure 1.

Table 1. Procurement Delivery Time

Delivery Time (days)	2009	2010	2011
0 - 30	43,46 %	42,77 %	42,75 %
31 - 60	25,75 %	23,04 %	20,05 %
61 - 90	15,58 %	15,44 %	13,73 %
91 - 120	6,69 %	6,50 %	8,83 %
121 - 150	4,91 %	4,18 %	6,13 %
151 - 180	1,71 %	4,24 %	4,00 %
181 - 210	0,85 %	1,45 %	2,26 %
211 - 240	0,43 %	1,04 %	0,77 %
240 <	0,64 %	1,33 %	1,48 %

Table 1 illustrates the delivery time (in days) of the goods since the goods ordered by the user until the goods are delivered to the user.

From Table 1, it can be seen that from 2009 to 2011, the procurement delivery time above 90 days increased, so that it can be concluded that there is an increase delays in the procurement delivery time in that 3 years. If the trend of procurement data from 2009 to 2011 was plotted on the graph will look like in Figure 1.

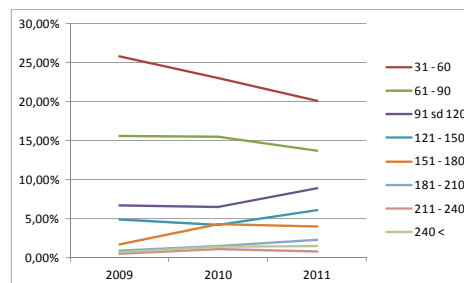


Figure 1 Trend of Procurement Delivery Time 2009 - 2011

Data in 2011 showed that although the occurrence of the procurement delivery time above 90 days only 23,74% but the value of the procurement is 65,34% of the total procurement in 2011.

## II. BUSINESS ISSUE EXPLORATION

### A. Conceptual Framework

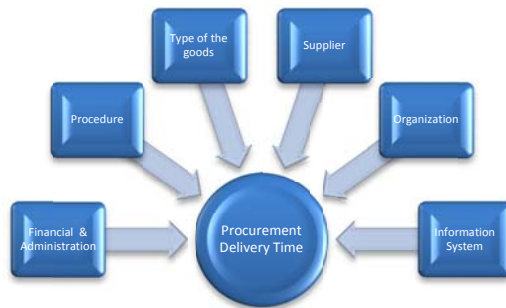


Figure 2. Conceptual Framework

#### A.1. Financial and Administration

In accordance with the Financial Information System documents of PT Len Industri, there are 4 (four) procedures related to financial administration that should be a reference in the procurement of goods and services in the Logistics Department as follows:

- Procedure of suppliers payment
- Procedure of import tax advance payment and take the Imported Goods from Customs
- Procedure of import advance payment by L / C
- Procedure of import advance payment by T / T

#### A.2. Procedure

As the state-owned company, procurement procedures applied in PT Len Industri should refer to government regulations. In this case the reference is the regulation of State Owned Company Minister number PER-05/MBU/2008 on General Guidelines for Procurement of Goods and Services in the State-Owned Company. With the basic regulation hence made the procurement of goods and services procedures of PT Len Industri in which there are several steps that must be passed in procurement and supplier selection. In the process of procurement / purchasing of goods and services there are five procedures which is the reference of the Logistics Dept. as follows (see Figure 3) :

- Procedure for Approval of Goods and Services Procurement (POP-102)
- Direct Purchase Procedure (POP-103)

- Direct Selection Procedure (POP-105)
- Open Tender Procedure (POP-106)
- Direct Appointment Procedure (POP-107)

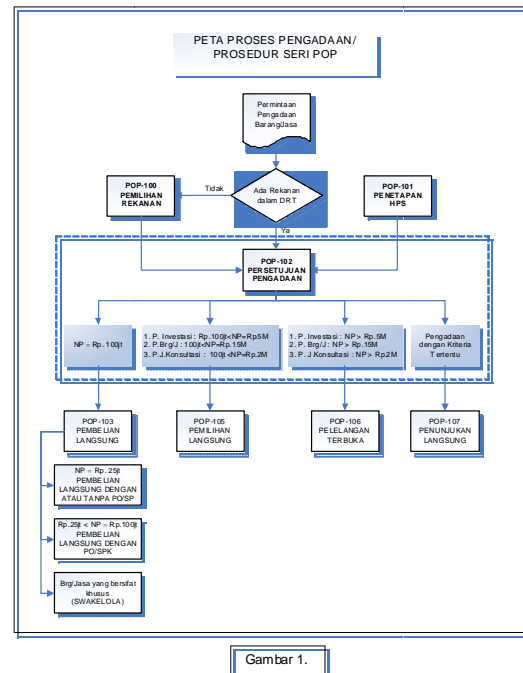


Figure 3. Map of Procurement Process / POP series Procedure

#### A.3. Type of The Goods

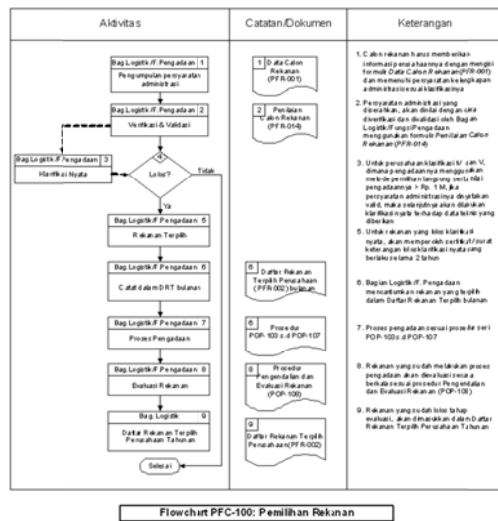
Type of the goods ordered by the user will also determine the lead time of the procurement process. For the goods that are very common in the market and widely used by consumers such as computers, laptops, printers and other consumer goods which very easy to get, the procurement process can take place quickly. But for the goods that are very specific and rare in the general market, it will takes a long time of the procurement process. Examples of these items are electronic components with certain technical specifications (e.g. military spec.) and the goods that are specific to the particular needs.

#### A.4 Suppliers

Selection of suppliers is based on POP-100 procedure (see Figure 4), which the supplier that meets the requirements incorporated into the Selected Suppliers List (Daftar Rekanan Terpilih, DRT).

In conducting the procurement process, Logistics Dept. / Procurement Function searches the goods / services from multiple suppliers contained in the DRT due to the fields / subfields and classification.

If there is no suppliers in the DRT can supply the goods needed, Logistics Dept / Procurement function search for new potential supplier.



**Figure 4** Supplier Selection Procedure (POP-100)

#### A.5. Organization

In PT Len Industries the work unit who carry out the purchase of goods is Logistics Dept. Currently Logistics Dept. is directly under the coordination of the Director of Technology & Production (no Division that houses the Logistics Dept.).

#### A.6. Information System

Currently in PT Len Industri there is Logistics Information System (Sistem Logistik, SILOG) used by the Logistics Dept and Procurement functions in the Business Unit to carry out the administration of the procurement process. With this SILOG then every user (who ordered the goods) entering the data of the goods into SILOG (through making the DPB), then the next process will be handled by the Logistics Dept or procurement function in Business Unit in accordance with the procedure described in the previous section.

In accordance with the procedure, with this SILOG does not mean that the procurement process takes place in paper-less, but SILOG more intended to facilitate the related work unit in doing the procurement process.

Unfortunately the related work unit are not used this SILOG to its full potential, they preferred not entering data that should be entered into the system because it is not mandatory, so as the result SILOG not functioning optimally. Besides, the behavior of the user is also still prefer to use written notes than using SILOG.

### The Value Chain Perspective

To get a better understanding of the processes occurring in the PT Len Industri then we will try to look at existing processes through Value Chain perspective that developed by Michael Porter in his book *Competitive Advantage* (see Fig. 5)



**Figure 5** A Corporation's Value Chain

### Primary Activities

#### a. Inbound Logistics

The materials included in Inbound Logistics are: raw materials, components, semi-finished product and finished product. When the goods arrive at PT Len Industri incoming inspection will be conducted by the staff of Department of QC, Planning Controlling (PC) & Production Engineering.

For materials that will go into production floor will be handled by Warehouse Dept and stored in the warehouse. As for the items that will be directly used in the project (usually in the form of semi-finished product or finished product) then the items are handled by the Procurement Function in Business Unit.

#### b. Operations

Production of Electronics & Mechanical Dept of the Production Division will undertake the production process with materials taken from the warehouse including the process of machining, assembling to testing. While the Solar Modules Production Dept perform special production process to produce solar modules. To control the implementation of the production process at the production floor was done by Department of QC, PC & Production Engineering, including scheduling, production control and quality control.

For items that directly used at the project location then the Project Management & Engineering Dept. of the Business Unit will perform further processing before being used by the Customer.

For the work that related to projects will undertaken by the Project Management & Engineering Dept. by establishing the project

teams, led by a Project Manager to handle projects in the Business Unit. The jobs handled by the Project Manager is planning, implementation and control of the project until the project is handed over to the customer.

#### **c. Outbound Logistics**

Finished product from the production floor will go to the warehouse before the finished product delivered to the Customer. Handling of finished product in the warehouse is done by Warehouse Dept. For delivery the finished product to the customer carried out jointly by Warehouse Dept and Logistics Dept in coordination with the Project Manager at Business Unit and Sales of Retail Product Dept in Business Development Division.

#### **d. Marketing & Sales**

Marketing and Sales conducted by Marketing and Sales Dept in Business Unit and Sales of Retail Product Dept in Business Development Division with activities that include the following:

- advertising
- promotion
- pricing
- channel relations
- customer management
- Sales analysis

These activities are undertaken by the account manager with responsible for expanding new customers and retain existing customers.

While market research conducted by the Corporate Marketing Dept to study the possibility of market and product expansion of PT Len Industri with due regard to overall corporate strategy in achieving its vision and mission.

#### **e. Service**

For the equipment installation on project site is undertaken by project teams under the coordination of the relevant Project Manager. If during the project contract period there are products that need repair then it is still the responsibility of the project team to fix the product, but if the contract has ended and the project was handed over to the Customer then if there are products need repair it is the responsibilities of the Project Management & Engineering Dept. of Business Unit.

### **Support Activities**

#### **a. Firm Infrastructure**

Accounting and Finance conducted by Finance & Accounting Division with its two department (Finance Dept and Accounting Dept). While the corporate strategic planning conducted by Management, Strategic & Operation Division with its three Dept (Corporate Planning Dept, Process Operation Dept and Quality System Dept) and Legal Dept under the Corporate Secretary will address company's issues related to the law.

#### **b. Human Resources Development**

Organization and Human Resources Development Dept under Corporate Secretary will do the activities related to Human Resources including recruiting, training, development and staff planning for the company organization.

#### **c. Technology Development**

Centre of Technology and Innovation Division as a centre of company's knowledge and core competence will do the activities related to technology development and innovation including research & development, product & process design, product & process improvement and market testing.

#### **d. Procurement**

As explained in the previous section that the procurement at PT Len Industri conducted by the Logistics Dept and Procurement functions in the Business Unit.

Logistics Dept serves the demand of goods and services from the Production Division, Centre of Technology & Innovation Division and other units of work that is in the corporation (except Business Unit).

While the Procurement function at the Business Unit serves the demand of goods and services from the business unit itself.

### ***B. Analysis of Business Situation***

To find the root cause of the problems faced, we used the CRT (Current Reality Tree) method. A Current Reality Tree (CRT) is a way of analyzing many system or organizational problems at once. By identifying root causes common to most or all of the problems, the CRT can greatly aid focused improvement of the system. A current reality tree isn't really a tree, but a directed graph (wikipedia.org, 2012).

As there is no sufficient quantitative data to be used to find the root cause, more qualitative assessment were used, based on key stakeholder experience. Through interview and discussion session involving Logistic Dept, Procurement Function in Business Unit, Finance Dept, Accounting Dept and end users, we get the CRT graph as depicted on Figure 6. and Figure 7.

In the sessions of interview and discussions, it was agreed that the main focus in searching the root cause of the problem are the internal problems in PT Len Industri, because the stakeholders believe that there is still much that can be done in the company to improve the late procurement issue. So in this discussion of CRT we are not discuss too deep matters relating with suppliers.

Some of the criteria used to determine the root cause of the problems is one of the following choices :

1. If we try to ask again "why" to a particular "cause", and we find no other reason than the emergence of the "cause" is.
2. If we try to ask again "why" to a particular "cause", and the answer is "because the procedure is so decisive"
3. If the "cause" that we find cannot be clearly defined (abstract)
4. If the "cause" that we find is the nature / behavior of person

From the CRT graph we found some root causes as follows :

- Insufficient human resources capabilities
- Iteration process between the Logistics Dept. and suppliers
- Waiting signature of the related structural official
- Company cash flow condition
- Undisciplined user in entering data to the Logistic information system (SILOG)
- Uncompleted document
- Too many documents in hard copy
- Shortage of HR in Verification function and Logistic Dept
- Difficult to know who/where the late process occurred

If we compare the root causes with initial conceptual framework, we will find out relations of factors in the conceptual framework and root causes. The relationship is depicted in table 2.

From table 2 we can see that there is no root cause related to the type of the goods as assumed in the conceptual framework.

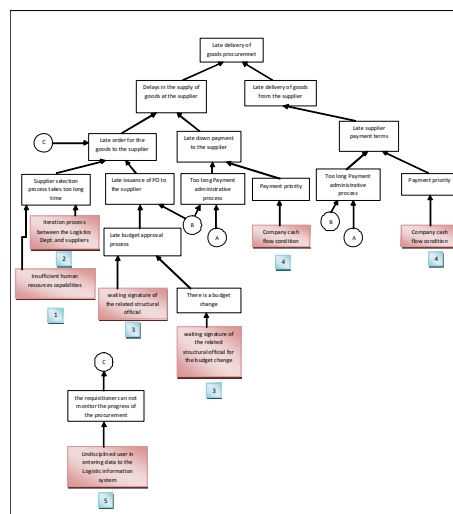


Figure 6. Current Reality Tree (CRT)

### III. BUSINESS SOLUTION

#### A. Alternative of Business Solution

Based on the issues that have been discussed in previous section there are several alternatives that could be used as solutions to overcome these problems. The alternatives are divided into 3 (three) parts, namely the Procedure & Process, Human Resources and Information System.

In this final project, it will not be discussed the root causes related to finance, so with eliminating the root causes of cash flow conditions, we obtained matrix table for the root causes and alternative solutions as depicted in the table 3.

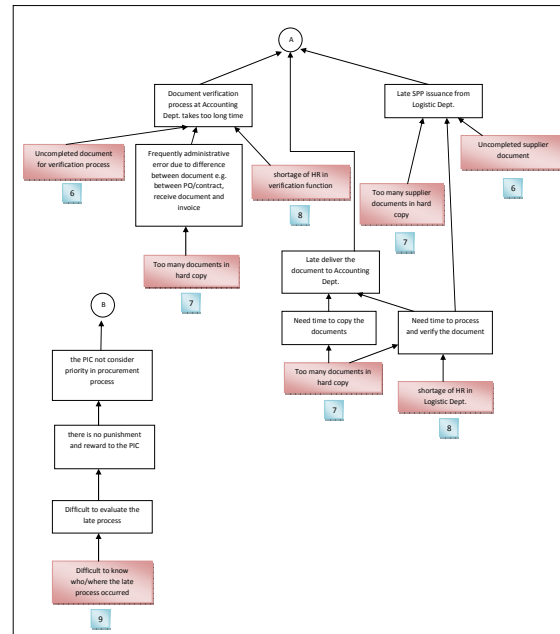


Figure 7 . Current Reality Tree (cont.)

In summary matrix of alternative solutions on the Table 3. can be written as follows:

- Procedure & Process :
  - Simplification of procedures
  - Control card and Form
- Human Resources :
  - Improve the HR capability
  - Recruitment for new employee
- Information System :
  - Information systems (IS) improvement
  - E-procurement

#### B. Analysis of Business Solution

##### 1. Simplification of Procedures

The author propose simplification of procedures that considered to be slowing down the procurement process. Simplification of procedures had to be a major concern for the effective and efficient procurement.



Examples of simplification of procedures such as follows :

- To avoid the iteration process between Logistics Dept. and supplier, simplify the procedures regarding the minimum requirements documents that should be provided by the supplier and the conversion of the minimum value required for the procurement of real clarification.
- To avoid the long process of getting the signature of related structural officials, it necessary to simplify the procedure for the distribution of authority among related structural officials. So there will be a value limits of certain procurement that not all structural officials need to signed his name.
- To avoid many of the documents in hard copy, simplify procedures for the distribution of hard-copy documents that must exist in each work unit. So with the simplification of procedures it will expected that no need to reproduce the same document to many units of work

Table 2. Relationship between Root Causes and Conceptual Framework

Root cause	Conceptual Framework					
	Financial & Administration	Procedure	Type of the Goods	Suppliers	Organization	Information System
Insufficient human resources capabilities					X	
Iteration process between the Logistics Dept. and suppliers		X		X		X
Waiting signature of the related structural official	X	X				
Company cash flow condition	X					
Undisciplined user in entering data to the Logistic information system (SILOG)					X	X
Uncomplete document		X		X		X
Too many documents in hard copy	X	X				X
Shortage of HR in Verification function and Logistic Dept.					X	
Difficult to know who/where the late process occurred		X				X

From the previous section we can see that there are two procedures that bind the procurement process : the procedures of Quality System and procedures of Financial Information System. From the existing procedures, we can see that there are process steps that can be combined into a single process or simplified process flow. If recently there are two procedures to be used as guidelines for the Logistics Dept. to the procurement process, so if possible, both procedures are combined into a single procedure only.

To perform this procedure simplification, of course there should be a coordination forum with related parties: System Quality Dept (in charge of issuing written procedures), Operations Process Dept, Logistics Dept, Procurement Function of Business Unit, Accounting Dept, Finance

Department and Internal Audit Unit. Coordination forum is expected to be carried out a thorough evaluation of the procedures relating to procurement by looking at all the possibilities that can accelerate and expedite the process due to the rules of applicable laws and regulations.

Table 3. Matrix of the Alternative Solutions

Root Causes	Alternative Solutions		
	Procedure & Process	Human Resources	Information System
Insufficient human resources capabilities		Improve the HR capability	
Iteration process between the Logistics Dept. and suppliers	Simplification of procedures		E-procurement
Waiting signature of the related structural official	Simplification of procedures		
Undisciplined user in entering data to the Logistic information system (SILOG)			IS improvement
Uncomplete document			E-procurement & IS improvement
Too many documents in hard copy	Simplification of procedures		E-procurement & IS improvement
Shortage of HR in Verification function and Logistic Dept		Recruitment for new employee	
Difficult to know who/where the late process occurred	Control card and Form		IS improvement

## 2. Control Card and Form

The root cause associated with Control Card & Form solutions is as follows:

- Difficult to know who/where the late process occurred

One reason why it's difficult to find out who and where the occurrence of delays in the procurement process is the absence of an effective control tool to monitor and control the procurement process so that it cannot operate effectively and efficiently.

For this reason the author propose the Control Card and Form to control the progress and the status of the procurement process. With this card and form, it is expected that every user who ordered the goods may have to know exactly how is the progress and the status of procurement of the goods they've ordered. With this card and form, it is also expected that we know where and when the delay process of the procurement process.

Control Cards and Form proposed are as follows:

1. Logistic Control Card
2. Document Control Card
3. Import Goods Monitoring Form

### 3. Improve the HR Capability

Based on the Figure 6 (CRT) it is known that the lack of personal knowledge and skills in the area of procurement cause a long time required for the suppliers selection, which in turn led to delays in issuing the POs to selected suppliers.

The author proposes a solution in the form of capacity building through education and training for employees in the Logistics Dept. Education and training can be done in the company by bringing in instructors from outside or the employees attend the education and training outside the company.

For this training plan of course there should be done coordination forum between Logistics Dept, the Organization Development and Human Resources Dept to plan education and training, budget preparation, selection of training provider / instructor and setting training schedules.

### 4. Recruitment for New Employee

Based on discussions with Procurement Process stakeholders as outlined in the CRT (see Figure 7) it was found that there is a shortage of employees in the Verification Function (in the Accounting Dept) and the Logistics Dept.

On the basis of the above considerations, the author proposes first held in-depth study to analyze the workload on Verification Function and Logistics Dept. If the result of Workload analysis on the two work units has been obtained it can be determined whether the two units is absolutely necessary the addition of employees or simply rotate and upgrading employees only.

### 5. Information systems (IS) improvement

In addition to the solutions described above, the author also propose the IS improvement :

- where IS is expected to provide facilities such as uploading a scan hard-copy documents so that any unit that requires the document can easily download it. It is expected that there will be no longer of outstanding hard-copy documents because everything is stored in the form of soft copy in the IS database.
- the proposed control cards and forms above can be also incorporated into the IS, although it will probably take a little change but with the purpose and nature remains the same, namely to control and evaluation of the procurement process.
- through the IS improvement, we can reduce the occurrence of uncompleted document.

### 6. E-procurement

There are several benefits that can be taken in the use of e-procurement as follows:

- Supplier can register on-line directly

- A required company documents were also submitted on-line
- No more physical documents that required in the Logistic Dept and Financial/Accounting Dept.

When suppliers apply through e-procurement facility then the supplier has submitted their company data through on-line. Supplier's company data will be entered into the data base, so if any part in PT Len Industri needed the data, they can get the data easily without having to reproduce them through hard copy. So if the Accounting Dept, in its verification activities require data of a supplier as a verification attachment, they can get the data from the database without the need to print or reproduce the copies of these documents. This will certainly save a lot of time spent in the procurement process.

## IV. CONCLUSION AND IMPLEMENTATION PLAN

Implementation plan of the solutions offered above is divided to three following periods (see Figure 8) :

1. Short Term :
  - a. Control card and Form
  - b. Simplification of procedures
2. Medium Term :
  - a. Improve the HR capability
  - b. Information systems (IS) improvement
3. Long Term :
  - a. Recruitment for new employee
  - b. E-procurement



Figure 8. Implementation Schedule

### Benefit and Cost Analysis

Procurement at PT Len Industri is closely related to the completion of projects undertaken. Data in 2011 states that the delivery time of procurement above 90 days (with occurrence rate of 23.74%) worth Rp. 933 billion of the total procurement Rp. 1.4 trillion (65.34%). If we

assume that the penalty for delay from the project owner is 0.01% per day of the value of the late delivery goods (instead of the value of the project), then the potential fines is Rp. 93 million per day.

If we assumed that the value of the procurement is still the same with data on 2011, with a pessimistic target of 5% it would have been avoided potential fine of Rp. 19.6 million per day, while with the optimistic target of 9%, potential penalties that can be removed is Rp. 35.3 million per day.

With the total cost of the improvement plan of Rp. 213.6 million and could be removed the potential fines between Rp. 19.6 million per day up to Rp. 35.3 million per day, it is time for the management of PT Len Industri to undertake corrective action to procurement system as proposed by this Final Project.

### **Key Success Factors**

For the success implementation of the solutions offered there are two key success factors to note as follows:

#### **a. Changing the mindset**

Look at the history of PT Len Industries that began as research institutions under LIPI with the status of its employees as government employee seem provide a strong enough influence to employees of PT Len Industri today. Although all current employees no longer with the status of the government employee but the working methods still cannot be separated entirely from the methods of government institution. While sales are still small, it does not seem to affect the overall performance, but when sales have reached \$ 1 trillion, that working method has the big impact to the company performance. For that PT Len Industri need to cultivate change in mind set on each employee that PT Len Industri is now a state-owned company in which one of its goal is to make

a profit so that all resources are deployed to achieve that goal.

#### **b. Commitment from Top Management**

To ensure that all of the solutions offered can run as expected then it is necessary to have the commitment of top management. Without the commitment of top management it is impossible that solutions offered can be run well. With the committed Top Management, it will encourage all levels of middle management to also carry out all the proposed solutions, which in turn will encourage all levels of employees to work together to do the proposed solutions for the improvement of the procurement delivery time.

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